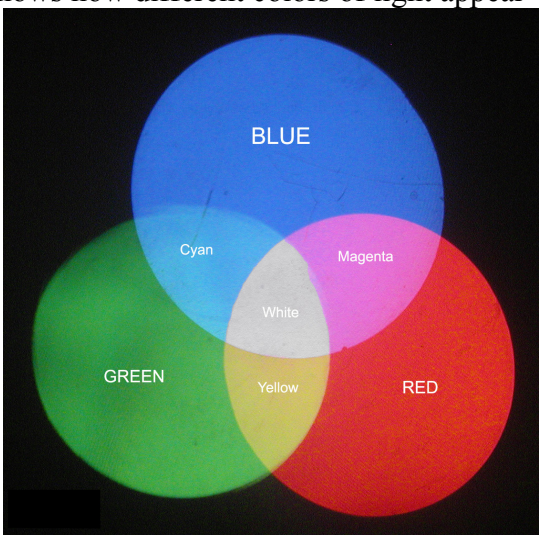
P-7.8 Compare color mixing in pigments to color mixing in light

Revised Taxonomy Level 2.6 Compare conceptual knowledge
Students did not address these principles in physical science.

- Mixing colored lights
  - Also called mixing colors by addition
  - If the frequencies of light are divided into three regions, the low frequency red, the middle frequency green and the high frequency blue
  - The middle and high frequencies combined appear cyan to the human eye
  - The middle and low frequencies combined appear yellow to the human eye
  - The low and high frequencies combined appear magenta to the human eye
  - The middle, low and high frequencies combined appear white to the human eye
  - The chart below shows how different colors of light appear



- Mixing colored pigments
  - Also called mixing colors by subtraction
  - Pigments absorb particular wavelengths and reflect particular wavelengths
  - The primary wavelengths reflected are listed in the chart below

Pigment	Absorbs	Reflects
Red	Blue, Green	Red
Green	Blue, Red	Green
Blue	Red, Green	Blue
Yellow	Blue	Red, Green
Cyan	Red	Blue, Green
Magenta	Green	Blue, Red

- However pigments also reflect some wavelengths that are close in frequency to the color reflected. (Blue pigment reflects not only blue light but also some frequencies of green and violet)
- When the pigments are mixed, the frequencies of light that are not absorbed by either pigment are reflected

Assessment

As stated in the indicator, the major focus of assessment is to compare (detect correspondences) in the ways different colors are produced by mixing lights and by mixing pigments. Because the indicator is written as conceptual knowledge, assessments should require that students understand the "interrelationships among the basic elements within a larger structure that enable them to function together." In this case, assessments must show that students understand the reasons for the difference in the colors that result when light is mixed and when pigments are mixed.